the limb or extremety to a target site; (iv) repeating step (iii) ten times; (v) repeating step (iv) three times; (vi) repeating step (v) to a different target; (vii) repeating step (vi) three times; (viii) allowing the individual to rest for a predetermined time period; (ix) repeating the cycle of steps (ii) through (viii) but concomitantly increasing the negating force acting upon the limb or extremety by about 10% of that used in the previous cycle of steps; (x) repeating step (ix) at least twenty two times; the steps resulting in training the individual having improved motor neuron acitivity when the negating force acting upon the limb or extremety is equivalent to about 300% of the weight of the individual's limb or extremety.

[0049] In a further embodiment, the invention provides a robotic device, the robotic device comprising a support splint, the support splint communicably attached to a force sensor, the force sensor communicably attached to a transducer capable of transducing a force input into a corresponding electrical or optical output; a central processing unit communicably attached to and receiving an input signal from the transducer and further communicably attached to and sending an output signal to a motor, wherein the motor is functionally attached to the robot arm.

[0050] In one embodiment, the system is a haptic system. In another embodiment, the force further results in allowing the individual to move the limb or extremety to a target site. In a preferred embodiment, the force is provided in at least two planes. In a more preferred embodiment, the force is provided in at least three planes. In another preferred embodiment, the force is provided in a plurality of planes.

[0051] In another embodiment, the invention provides a robotic device, the robotic device comprising a support splint, the support splint comprising an arm rest, an arm cuff, a hand splint; a gimbal, a strain gauge force sensor, an end effector, a robot arm, a robot stand, and a servo motor; wherein the support splint is fixedly attached to the gimbal, the gimbal is fixedly attached to the strain gauge force sensor, the strain gauge force sensor is attached to the end effector, and the end effector is fixedly attached to the robot arm; the robot arm is fixedly attached to the servo motor, and the servo motor is fixedly attached to the robot base; wherein in use, when a first force is applied to the support splint the force is then transmitted to the gimbal, then transmitted to the strain gauge force sensor, the strain gauge force sensor converts the first force into a proportional electronic signal, the electronic signal is transmitted to a control unit comprising a central processing unit, the central processing unit processes the electronic signal, the central processing unit transmitts the processed electronic signal to the servo servo motor, and the servo motor responds to the electronic signal by exerting a second force upon the robot arm. Preferably, the second force acting upon the robot arm results in an apparent inertial mass of the robot arm at the gimbal of not more than 2 kg. More preferably, the apparent inertial mass of the robot arm at the gimbal is not more than 1 kg.

[0052] In an additional embodiment, the gimbal has at least two degrees of freedom. More preferably, the gimbal has at least three degrees of freedom. In a further additional embodiment, the load cell has at least three degrees of freedom. More preferably, the load cell has six degrees of freedom.

[0053] In a yet further embodiment, the gimbal comprises at least one position sensor. The position sensor is used to measure the elbow and shoulder rotation angles. Preferably the gimbal has a three position sensor, a position sensor for each degree of freedom.

[0054] In a further embodiment of the invention, the robotic device further comprises supporting means, the supporting means selected from the group consisting of a chair, a bed, a back support, and a trunk support. In one preferred embodiment of the invention, the robotic device comprises a chair. In a more prefered embodiment, the chair is a Biodex chair. In a still further embodiment the robotic device further comprises a T-support track, wherein the robotic device and the chair are positioned proximally on the T-support track.

[0055] In an additonal embodiment of the invention, the robotic device comprises a visual display unit (VDU) screen in interactive communication with the control unit. The interactive communcation is preferably a signal, the signal being selected from the group cnsisting of an electrical signal, a photonic signal, and a radio signal.

[0056] In another embodiment, the robotic device comprises a data acquisition computer with screen and printer that is in communication with and regulates the robotic device and the three-dimensional (3-D) visual display screen. In a preferred embodiment, the computer comprises the user interface to allow data collection during the evaluation and training of the stroke subject and subsequent data access for creating standardized clinical progress reports.

[0057] In one embodiment of the invention the robotic device, the control unit comprises a computer with a real-time operating system, motor amplifiers, and an emergency circuit.

[0058] In another preferred embodiment, the robotic device comprises safety and protection mechanisms to safeguard against equipment malfunction. In an additional embodiment, the robotic device comprises hardware safeguards to physically limit the available robot travel range. In a preferred embodiment, a disconnecting switch is activated when a predetermined and safe force level at the subject's arm is exceeded, while simultaneously turning electrical power off to the robotic device.

[0059] The invention provides a method for diagnosing a neurological condition in a subject, the method comprising measuring a subject's joint torques using the robotic device as described herein. In a preferred embodiment, the neurological condition is selected from the group consisting of hemiparetic stroke, cerebral palsy, head trauma, and multiple sclerosis.

[0060] The invention also provides a method for measuring the degree of rehabilitation of a subject with a neurological condition, the method comprising measuring a subject's joint torques at a first time starting rehabilitation and then periodically during rehabilitation using the robotic device as described herein. In a preferred embodiment, the neurological condition is selected from the group consisting of hemiparetic stroke, cerebral palsy, head trauma, and multiple sclerosis.

[0061] The invention also provides a method for measuring the temporal change in severity of a neurological condition in a subject, the method comprising measuring a subject's joint torques at a first time and then periodically